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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/212,726	12/15/1998	KLAUS F. SCHUEGRAF	M122-1098	7984

21567 7590 10/17/2003
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EXAMINER

KIELIN, ERIK J

ART UNIT PAPER NUMBER

2813

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/212,726

Applicant(s)

SCHUEGRAF, KLAUS F.

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 60-64, 66-68 and 70 is/are pending in the application.
- 4a) Of the above claim(s) none is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 60-64, 66-68 and 70 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

This action responds to the Amendment filed 28 July 2003 (Paper no. 27).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 60-64, 66-68, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,710,079 (**Sukharev**) in view of US 5,314,724 (**Tsukune et al.**) and considered with **Wolf**, et al. Silicon Processing for the VLSI Era, Vol. 1-Process Technology, Lattice Press: Sunset Beach CA, 1986, pp. 166-167, for a showing of inherency only.

Regarding claim 60, **Sukharev** discloses a semiconductor processing method of depositing a SiO₂ layer comprising,

providing a substrate **101** within a cold-wall, chemical vapor deposition (CVD) reactor **300** (Figs. 1 and 3);

feeding a gaseous silicon precursor into the CVD reactor (col. 3, lines 50-65);

feeding gaseous H₂O₂ into the CVD reactor (col. 3, lines 50-65); and

utilizing the silicon precursor, depositing a layer of SiO₂ over a surface of the substrate at a rate of 7000 Å per minute (col. 3, lines 50-65).

It is seen to be inherent that the reactor of **Sukharev** is a cold-wall reactor, because the heating of the wafers is via the susceptor (**Sukharev**, col. 6, lines 24-31). **Wolf** at pages 166-167

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indicates that when the heating comes from within the reaction chamber, that the reactor is called a “cold-wall” reactor, as compared to a “hot-wall” reactor wherein the heating elements are located external to the chamber.

Sukharev does not indicate that the deposition rate is about 7000 Å/min.

Tsukune discloses a CVD method of depositing a SiO₂ layer wherein the deposition rate is taught in one exemplary embodiment to be 7000 Å/min.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to apply the deposition rate of **Tsukune** to that of **Sukharev** because **Tsukune** teaches that the deposition rate is common in the art. Moreover, the instant specification provides no indication that the deposition rate has anything to do with the object of (criticality of) the instant invention which, as indicated in the instant specification at page 4 is to prevent the formation of undesired reaction intermediates in the decomposition of the CVD precursor gases.

Regarding claim 61, **Sukharev** discloses that the gaseous precursors are independently fed into the CVD reactor (Fig. 2).

Regarding claim 62, **Sukharev** discloses that the precursors are necessarily fed into the CVD reactor simultaneously (col. 3, lines 55-59).

Regarding claim 63, **Sukharev** discloses that the gaseous H₂O₂ and the gaseous silicon precursor are comprised by a gaseous mixture that is fed into the chemical vapor deposition reactor (col. 3, lines 55-59).

Regarding claim 64, **Sukharev** discloses that gaseous H₂O is also fed into the CVD reactor (col. 3, lines 55-59).

Regarding claim 66, **Sukharev** shows that the substrate **101** is shown to have a high aspect ratio and that the SiO_2 is conformally deposited, by definition, since the SiO_2 film “conforms” to the surface (Fig. 1).

Regarding claim 67, **Sukharev** discloses that the gaseous precursor may be at least TEOS (col. 3, lines 55-59).

Regarding claim 68, **Sukharev** discloses that the deposition temperature is preferably 400 °C (col. 6, lines 24-27).

Regarding claim 70, the prior art as explained above discloses all of the limitations of the instant invention, but does not teach the claimed concentration range of 5-15% H_2O_2 . Instead, **Sukharev** discloses ranges of 0.5 to 3% H_2O and 0-3% H_2O_2 . However, it has been held that choosing parameters within or near ranges taught by the prior art is *prima facie* obvious. See *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). Therefore, it would have been obvious to choose a concentration with 5% and 15% because **Sukharev** discloses a range near the claimed range, according to the precedent set by *In re Wertheim* or *In re Huang*. Moreover, the concentration range for H_2O and/or H_2O_2 indicated in the specification to provide conditions “which are effective to reduce formation of undesired reaction intermediates” --the object of the invention-- range from less than 0.5% to 50% (see specification page 12, lines 3-13) and overlap those in **Sukharev**, e.g. 0.5 to 3% H_2O and 0-3% H_2O_2 . Accordingly, there is nothing critical to the range now claimed in instant claim 69.

Response to Arguments

3. Applicant's arguments filed 28 July 2003 (Paper no. 27) have been fully considered but they are not persuasive.

Applicant argues that there is no suggestion to combine the Sukharev and Tsukune references. Examiner respectfully disagrees. While Examiner does not believe that the Tsukune reference is even necessary, the reference goes to show that there exists nothing novel whatsoever about the deposition rate of 7000 Å. Moreover, the deposition rate is not the instant invention. Rather the instant invention is the use of H₂O and/or H₂O₂ to reduce the formation of undesired intermediates. Also note, these claims are *prima facie* obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

Examiner respectfully submits that Applicant is grossly in error regarding Tsukune. It is --in fact-- a silicon oxide layer. That it is further processed does not change the fact layer deposited is silicon oxide. Moreover, there is absolutely no teaching away in Tsukune from Sukharev regarding the deposition rate.

Finally it is noted that MPEP 2145 states that “argument does not replace evidence where evidence is necessary.” Applicant has not provided evidence that the exemplary deposition rate from the specification provides some unexpected result.

Accordingly, the claims are not enforceable over Sukharev alone, much less over Sukharev in view of Tsukune.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Erik Kielin
Primary Examiner
October 11, 2003